

CLAIMS

We Claim:

1 1. A method for monitoring a laser signal comprising:
 2 (a) forwarding the laser signal to an etalon;
 3 (b) detecting light transmitted through the etalon;
 4 (c) detecting light reflected from the etalon; and,
 5 (d) calculating a ratio from the detected light transmitted through the
 6 etalon and the light reflected from the etalon.

1 2. A method as in claim 1 wherein in (d) the ratio is equal to power of the
 2 light transmitted through the etalon divided by power of the light reflected
 3 from the etalon.

1 3. A method as in claim 1 wherein in (d) the ratio is equal to power of the
 2 light reflected from the etalon divided by power of the light transmitted
 3 through the etalon.

1 4. A method as in claim 1 wherein in (d) the ratio is represented below:

$$2 \quad \frac{P_t[\lambda]}{P_r[\lambda]} = \frac{T}{R} \frac{1}{F \sin^2 \left[\frac{2\pi nd \cos(\theta)}{\lambda} \right]}$$

3 where $P_t[\lambda]$ represents detected power of the light transmitted through the
 4 etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T
 5 represents transmittance of the etalon, R represents reflectance of the etalon, F is

6 a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of
 7 the etalon, d is a cavity length, θ is an angle at which an incident beam passes
 8 through the cavity, and λ is a wavelength of the laser signal.

1 5. A method as in claim 1 wherein in (d) the ratio is represented below:

$$2 \quad \frac{P_r[\lambda]}{P_t[\lambda]} = \frac{R}{T} F \sin^2 \left[\frac{2\pi n d \cos(\theta)}{\lambda} \right]$$

3 where $P_t[\lambda]$ represents detected power of the light transmitted through the
 4 etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T
 5 represents transmittance of the etalon, R represents reflectance of the etalon, F is
 6 a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of
 7 the etalon, d is a cavity length, θ is an angle at which an incident beam passes
 8 through the cavity, and λ is a wavelength of the laser signal.

1 6. A method as in claim 1 wherein the etalon is a Fabry-Perot etalon.

1 7. A system that monitors a laser signal, the system comprising:
 2 an etalon that receives the laser signal;
 3 a first detector that detects light transmitted through the etalon;
 4 a second detector that detects light reflected from the etalon; and,
 5 a monitor that calculates a ratio from the detected light transmitted
 6 through the etalon and the light reflected from the etalon.

1 8. A system as in claim 7 wherein in the ratio is equal to power of the
2 light transmitted through the etalon divided by power of the light reflected
3 from the etalon.

1 9. A system as in claim 7 wherein the ratio is equal to power of the light
2 reflected from the etalon divided by power of the light transmitted through the
3 etalon.

1 10. A system as in claim 7 wherein the ratio is represented below:

$$2 \quad \frac{P_t[\lambda]}{P_r[\lambda]} = \frac{T}{R} \frac{1}{F \sin^2 \left[\frac{2\pi n d \cos(\theta)}{\lambda} \right]}$$

3 where $P_t[\lambda]$ represents detected power of the light transmitted through the
4 etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T
5 represents transmittance of the etalon, R represents reflectance of the etalon, F is
6 a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of
7 the etalon, d is a cavity length, θ is an angle at which an incident beam passes
8 through the cavity, and λ is a wavelength of the laser signal.

1 11. A system as in claim 7 wherein the ratio is represented below:

$$2 \quad \frac{P_r[\lambda]}{P_t[\lambda]} = \frac{R}{T} F \sin^2 \left[\frac{2\pi n d \cos(\theta)}{\lambda} \right]$$

3 where $P_t[\lambda]$ represents detected power of the light transmitted through the
4 etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T

5 represents transmittance of the etalon, R represents reflectance of the etalon, F is
6 a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of
7 the etalon, d is a cavity length, θ is an angle at which an incident beam passes
8 through the cavity, and λ is a wavelength of the laser signal.

1 12. A system as in claim 7 wherein the etalon is a Fabry-Perot etalon.

1 13. A system as in claim 7 wherein the system additionally comprises:
2 a reference device that receives the laser signal; and,
3 a detector that detects light transmitted through the reference device.

1 14. A system as in claim 13 wherein the reference device is a gas cell.

1 15. A system as in claim 13 wherein the monitor uses a ratio
2 equal to power of the light transmitted through the etalon divided by power of
3 the light reflected from the etalon to compare the etalon with the reference
4 device.

1 16. A system as in claim 13 wherein the monitor uses a ratio
2 equal to power of the light transmitted through the etalon divided by power of
3 the light reflected from the etalon to compare the etalon with the reference
4 device and the monitor uses a ratio equal to power of the light reflected from

5 the etalon divided by power of the light transmitted through the etalon to
6 interpolate between peaks.

1 17. A system that monitors a laser signal, the system comprising:
2 a measurement means for receiving the laser signal;
3 a first detection means for detecting light transmitted through the
4 measurement means;
5 a second detector means for detecting light reflected from the
6 measurement means; and,
7 a device means for calculating a ratio from the detected light transmitted
8 through the measurement means and the light reflected from the measurement
9 means.

1 18. A system as in claim 17 wherein in the ratio is equal to power of the
2 light transmitted through the measurement means divided by power of the light
3 reflected from the measurement means.

1 19. A system as in claim 17 wherein the ratio is equal to power of the
2 light reflected from the measurement means divided by power of the light
3 transmitted through the measurement means.

1 20. A system as in claim 17 wherein the system additionally comprises:
2 reference means for receiving the laser signal; and,

- 3 a third detector means for detecting light transmitted through the
4 reference device.